

Atmos. Chem. Phys. Discuss., referee comment RC1
<https://doi.org/10.5194/acp-2022-23-RC1>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on acp-2022-23

Anonymous Referee #1

Referee comment on "Measurement report: Distinct size dependence and diurnal variation in organic aerosol hygroscopicity, volatility, and cloud condensation nuclei activity at a rural site in the Pearl River Delta (PRD) region, China" by Mingfu Cai et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-23-RC1>, 2022

Review of "Measurement Report: Distinct size dependence and diurnal variation of OA hygroscopicity, volatility, and CCN activity at a rural site in the Pearl River Delta (PRD) region, China" by Cai et al.

Cai et al. compile a report of findings of a comprehensive study of CCN activity for a measurement campaign in the Pearl River Delta (PRD) utilizing a complete suite of instruments to measure and understand the hygroscopicity and volatility from several differing methodologies. The work is of high quality and is complete and representative. I recommend it for publication with minor changes/corrections as listed below:

Line 82: "and plant" seems that some words are missing here, the intent of the sentence is unclear with the addition of plant.

Lines 87-90: Here in the summary of several previous works it isn't mentioned where or under what conditions these varying hygroscopicities were reported.

Line 174: I think that this is the line where PNSD needs to be defined, it is not defined anywhere in the paper.

Line 226: Why not report R to one more digit at least? (8.314)

Line 228: meters not meter.

Line 249: Here you state the assumption relative to internally mixed particles, but the GF HTDMA data indicates that at the very least some of the mixture was externally mixed. What effect if any does this have on the analysis?

Line 368: Hong Kong (two words).

Line 376: Replace "It" with "This".

Line 411: replace organics with organic.

Line 418: This paragraph appears to make an argument that CCN measurements report kappa values that would be considered in-correct. If this is used to measure actual CCN activity and predict them, wouldn't a CCN instrument be the more appropriate measurement instead of an HTDMA, where the hygroscopicity of the HTDMA instrument would be the biased one? Understanding that the kappa values are different, which is more appropriate for estimating modelled Nccn? (this is again brought up on line 560).

Line 602/603: This sentence needs to be reworked, it is unclear which statements and values correspond.

Figure 4: In panel A consider different colors (red/green color-blind issues).